

ABSTRACT

A new method to capture, purify and expand antigen-specific T lymphocytes has been developed using magnetic beads coated with recombinant MHC class I molecules. This method was optimized using homogenous populations of naive T cells purified from mice transgenic for the 2C T cell receptor (TCR). These T cells were captured on beads coated with MHC class I molecules and the relevant antigenic peptides. MHC and peptide specificity was confirmed by the usage of irrelevant MHC peptide combinations. An enrichment of 800 to 1600 fold was measured, using 2C T cells mixed with irrelevant T cells, starting from a 2C T cell frequency of 1/3000. The same approach was used to purify antigen-specific CD8⁺ T cells from total CD8⁺ T cells from naive mice. The recovered cells could be expanded and specifically kill target cells *in vitro*; they had a significant effect *in vivo* as well. We expect this procedure to be suitable to purify and expand *in vitro* tumor- and virus-specific killer T cells for use in cell therapy.